

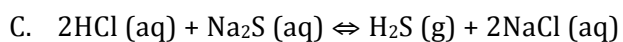
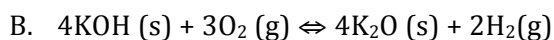
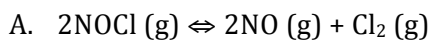
Equilibrium Constants

Name: _____

Date: _____ Per: _____

Directions: Answer the following questions regarding chemical equilibrium.

1. Write the equilibrium for each of the following reactions:



2. Consider the following reaction: $\text{N}_2 \text{(g)} + 3\text{H}_2 \text{(g)} \rightleftharpoons 2\text{NH}_3 \text{(g)}$

A. Write the equilibrium expression.

B. Calculate the value of the equilibrium constant for the reaction given equilibrium concentrations as follows: $[\text{N}_2]=0.592\text{M}$; $[\text{H}_2]=0.412\text{M}$; and $[\text{NH}_3]= 0.102\text{M}$

3. Consider the following reaction: $\text{N}_2\text{O}_4 \text{(g)} \rightleftharpoons 2\text{NO}_2 \text{(g)}$

A. Write the equilibrium expression.

B. Calculate the value for the equilibrium constant given the following concentrations: $[\text{NO}_2]= 0.185\text{M}$; $[\text{N}_2\text{O}_4]= 0.291\text{M}$

4. The dissociation for hydrofluoric acid is as follows: $\text{HF (aq)} + \text{H}_2\text{O (l)} \rightleftharpoons \text{H}_3\text{O}^+ \text{(aq)} + \text{F}^- \text{(aq)}$
- Write the K_a expression for the hydrofluoric acid dissociation reaction equation.
 - The actual value for this dissociation reaction is known to be $K_a = 7.1 \times 10^{-4}$. Does this reaction favor the reactants or products? How do you know?
 - What does this mean for the relative amount (in other words, a lot or a little) of H_3O^+ produced by this acid?
 - Would you expect a dilute solution of hydrofluoric acid to have a pH closer to 1 or closer to 6? Support your response.
5. Strong acids dissociate almost completely. HCl is a strong acid.
- Write the equation for the dissociation of hydrochloric acid in water.
 - Would you expect a numeric value for K_a to be large or small? Support your response.
6. Pyruvic acid and carbonic acid are both common acids found in the human body. Pyruvic acid has a K_a value of 4.36×10^{-3} while carbonic acid has a K_a 4.7×10^{-7} . Which acid is stronger? Support your response.